Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of the claims in the application:

Listing of Claims:

1. (Currently Amended) A method comprising the steps of:

extracting an object of interest from a video stream;

analyzing said object from said video stream to obtain an analyzed object, <u>said step of analyzing comprising at least one of the steps of determining a rigidity of said object, determining a periodic sequence corresponding to said object, or determining a periodic sequence corresponding to said object and at least one parameter describing an appearance of said object</u>;

manipulating said analyzed object to obtain a synthetic character; and

assembling a virtual video using said synthetic character.

2. (Original) The method of claim 1, wherein said step of extracting comprises the step of employing a stochastic background modeling technique to detect said object in said video stream.

3. (Original) The method of claim 1, wherein said step of extracting comprises the step of employing a motion detection technique to detect said object in said video stream.

4. (Original) The method of claim 1, wherein said step of extracting comprises the step of employing a segmentation technique to detect said object in said video stream.

5. (Original) The method of claim 1, wherein said step of extracting comprises the step of extracting background components from said video stream.

6. (Original) The method of claim 1, wherein said step of extracting comprises the steps of:

determining if a pixel in a frame of said video stream represents an object that is moving based on a stochastic model of a background scene in said frame; and

clustering pixels in said frame that represent said object that is moving.

7. (Original) The method of claim 1, further comprising the step of tracking said object.

8. (Original) The method of claim 7, wherein said step of tracking comprises the steps of:

identifying a position of said object in a frame of said video stream;

identifying candidate objects in a next frame of said video stream; and

comparing said object in said frame with candidate objects in said next frame to determine a next position of said object in said next frame.

9. (Canceled)

10. (Currently Amended) The method of claim [[9]]1, wherein said step of determining said rigidity comprises the step of determining a residual flow for said object.

11. (Canceled)

12. (Currently Amended) The method of claim [[11]]1, wherein said periodic sequence represents one cycle of motion of said object over a series of frames, and wherein said periodic sequence comprises, for each frame of said set of frames, a visual appearance of said object and a frame-to-frame displacement of said object.

13. (Currently Amended) The method of claim [[11]]1, wherein said step of determining said periodic sequence comprises the steps of:

collecting a set of visual templates of said object from a series of frames of said video stream, said set of visual templates comprising at least one complete period of motion of said object; and

matching a present visual template of said object with each visual template of said set of visual templates to determine a starting point of said period of motion of said object.

14. (Original) The method of claim 13, wherein said step of matching comprises the steps of:

determining a convolution of said present visual template with each visual template of said set of visual templates; and

selecting said starting point of said period of motion based on a minimum of said convolution.

15. (Currently Amended) The method of claim 1, ~~wherein said step of analyzing comprises the step of determining a periodic sequence corresponding to said object and at least one parameter describing an appearance of said object, and the method~~ further comprising the step of transmitting or storing said periodic sequence and said at least one parameter.

16. (Original) The method of claim 1, wherein said step of manipulating is directed by a user.

17. (Original) The method of claim 1, wherein said step of manipulating is directed by a computation engine.

18. (Original) The method of claim 1, wherein said synthetic character is a hybrid based on said object of interest and computer-generated imagery.

19. (Original) The method of claim 1, further comprising the step of providing a second synthetic character generated by a computer graphics engine, and wherein said step of assembling comprises the step of assembling said virtual video using said synthetic character and said second synthetic character.

20. (Original) The method of claim 1, wherein said step of assembling comprises the step of inserting said synthetic character into said video stream.

21. (Original) The method of claim 20, wherein said synthetic character is inserted based on rigidity and periodicity of said synthetic character.

22. (Original) The method of claim 20, wherein said step of inserting comprises the steps of:
selecting a starting frame in said video stream and a position within said starting frame for inserting said synthetic character; and
inserting a periodic sequence corresponding to said synthetic character beginning in said starting frame and at said position.

23. (Original) The method of claim 22, wherein said periodic sequence represents one cycle of motion of said synthetic character, and wherein said periodic sequence comprises, for each frame of said set of frames, a visual template of said synthetic character and a frame-to-frame displacement of said synthetic character.

24. (Original) The method of claim 23, wherein said step of inserting further comprises the step of multiplying each visual template by a scale factor to adjust a size of said synthetic character.

25. (Original) The method of claim 23, wherein said step of inserting further comprises the step of multiplying each frame-to-frame displacement by a time factor to adjust a speed of motion of said synthetic character.

26. (Original) The method of claim 23, wherein said step inserting further comprises the step of applying a flip operator to each visual template to reverse a direction of motion of said synthetic character relative to a direction of motion of said synthetic character in said periodic sequence.

27. (Original) The method of claim 20, wherein said synthetic character is occluded in said video stream.

28. (Original) The method of claim 20, wherein said step of inserting comprises the step of modifying at least one of appearance, scale, position, speed, direction of motion, and timing, prior to insertion of said synthetic character into said video stream.

29. (Original) The method of claim 1, wherein said step of assembling comprises the step of removing said synthetic character from said video stream.

30. (Original) The method of claim 29, wherein said step of removing comprises the step of filling in pixels in frames of said video stream with pixels from a background model for said synthetic character removed from said video stream.

31. (Original) The method of claim 29, wherein said step of removing comprises the step of repairing at least one of an uncovered background, a foreground object, and another synthetic character.

32. (Original) The method of claim 1, further comprising the step of determining functional areas within said video stream.

33. (Original) The method of claim 1, further comprising performing the method of claim 1 for a plurality of objects of interest in said video stream.

34. (Original) The method of claim 1, wherein said steps of extracting, analyzing, manipulating, and assembling are performed in real time.

35. (Original) The method of claim 1, wherein at least one of said steps of extracting, analyzing, manipulating, and assembling is performed in non-real time.

36. (Original) The method of claim 1, wherein said video stream comprises a background for a game.

37. (Original) The method of claim 1, wherein said video stream comprises a simulation.

38. (Original) The method of claim 1, wherein said video stream comprises a teleconference.

39. (Original) The method of claim 1, wherein said video stream comprises a distance education presentation.

40. (Original) A computer system to perform the method of claim 1.

41. (Original) A system comprising means for processing to perform the method of claim 1.

42. (Original) A computer-readable medium comprising software to perform the method of claim 1.

43. (Currently Amended) A method comprising the steps of:

obtaining a video stream as a setting for one of a video game, a simulation, a teleconference, and a distance education presentation;

tracking a moving object in said video stream;

analyzing said moving object to obtain an analyzed moving object, said analyzing step comprising representing said moving object by a periodic sequence;

generating a synthetic character based on a said analyzed moving object; and

assembling a virtual video based on said synthetic character and said video stream.

44. (Canceled)

45. (Currently Amended) The method of claim 43, wherein said step of generating is in response to a user of one of said video game, said simulation, said teleconference, and said distance education presentation.

46. (Original) The method of claim 43, wherein said step of assembling comprises the step of inserting said moving object into said virtual video based on said synthetic character.

47. (Original) The method of claim 43, wherein said step of assembling comprises the step of removing said moving object from said virtual video based on said synthetic character.

48. (Original) A computer system to perform the method of claim 43.

49. (Original) A system comprising means for processing to perform the method of claim 43.

50. (Original) A computer-readable medium comprising software to perform the method of claim 43.

51. (Currently Amended) A method comprising the steps of:

    extracting in real time a background model from a video stream;

    generating in real time a synthetic character; ~~and~~

    <u>identifying a functional area in said video stream; and</u>

    assembling in real time a virtual video based on said background model, ~~and~~ said synthetic character, <u>and said functional area</u>.

52. (Original) A method as in claim 51, wherein said step of generating comprises generating said synthetic character using a computer graphics engine.

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53. (Original) A method as in claim 51, further comprising the step of extracting in real time an object of interest from said video stream, and wherein said step of generating comprises generating said synthetic character using said object.

54. (Currently Amended) A method as in claim 51, further comprising the step of extracting in real time an object of interest from said video stream, and wherein said step of generating comprises generating said synthetic character using said object and a computer graphics engine.

55. (Canceled).

56. (Original) A computer system to perform the method of claim 51.

57. (Original) A system comprising means for processing to perform the method of claim 51.

58. (Original) A computer-readable medium comprising software to perform the method of claim 51.